Exercise 1

Show: A pseudotriangulation on a set P of n points is minimum (i.e., has a minimum possible number of edges) if and only if it is pointed.

A vertex v of a plane graph G is pointed if there exists a closed halfplane h passing through v such that no edge of G incident to v intersects h in a point other than v.

Exercise 2

Show that the Minkowski sum of two convex polygons P and Q with m and n vertices, respectively, is a convex polygon with at most m + n edges. Give an O(m + n) time algorithm to construct it.

Exercise 3

Given an ordered set X = (x₁, ..., xₙ) and a weight function w : X → ℜ⁺, show how to construct in O(n) time a binary search tree on X in which x_k has depth O(1 + log(W/w(x_k))), for 1 ≤ k ≤ n, where W = ∑_{i=1}^{n} w(x_i).